

Virginia Department of Health
Anthrax: Overview for Healthcare Providers

	Cutaneous	Inhalational	Gastrointestinal
Organism	<i>Bacillus anthracis</i> : Gram-positive bacteria, encapsulated, spore forming, non-motile rod		
Infective Dose	A few spores may cause infection	As few as 1 to 3 spores may cause infection	Unknown
Route of Infection	Contact with break in skin (frequently arms, hands, face, neck)	Inspired	Ingestion of contaminated meat from diseased animals; no U.S. cases to date
Communicability	Transmission from person-to-person is extremely rare.		
Case Fatality	<1% with treatment; 20 % without treatment	>75% with treatment (2001 outbreak- 5 of 11cases); 97% without treatment	Case fatality rate with treatment is unknown; 25-60% without treatment
Incubation Period	1 to 7 days (up to 12 days)	2 to 60 days or longer (2001 outbreak- 4 to 6 days)	Usually 2 to 5 days (range 1 to 7 days)
Clinical Manifestations	<ul style="list-style-type: none">• Small papule or vesicle (±pruritis)→ papule ulcerates with central necrosis and drying → painless, localized, nonpitting edema surrounds the ulcerated area → dark, leathery eschar• Extensive nonpitting edema, regional lymphadenopathy, lymphangitis, fever, and malaise may be present.	<ul style="list-style-type: none">• 1st stage: nonspecific prodrome of malaise, myalgias, fever, headache, nonproductive cough, nausea, abdominal pain; (some have brief period of apparent recovery before progressing to 2nd stage)• 2nd stage: develops abruptly with sudden fever, dyspnea, diaphoresis, shock; massive lymphadenopathy and widening of mediastinum on X-ray→ cyanosis & hypotension progress rapidly → death	<ul style="list-style-type: none">• Oral-pharyngeal form: oral/esophageal ulcer → bilateral neck swelling, edema, sepsis• Abdominal form: nausea/vomiting, malaise → bloody diarrhea, sepsis → 1° intestinal lesions in ileum/cecum• Ulcerations can occur anywhere along the GI tract and may cause hemorrhage, obstruction or perforation
Differential Diagnosis	Brown recluse spider bite, staphylococcal or streptococcal cellulitis, vasculitides, bubonic plague, necrotizing soft tissue infections, orf, necrotic herpes simplex infection; ulceroglandular tularemia, scrub typhus, rickettsial spotted fevers, rat bite fever, ecthyma gangrenosum	Mycoplasmal pneumonia, legionnaires’ disease, psittacosis, tularemia, viral pneumonia, Q fever, histoplasmosis, coccidioidomycosis, acute bacterial mediastinitis, tuberculosis	<ul style="list-style-type: none">• Oral-pharyngeal form: diphtheria, streptococcal pharyngitis, enteroviral vesicular pharyngitis, acute herpetic pharyngitis, <i>Yersinia enterocolitica</i>• Abdominal form: Typhoid fever, intestinal tularemia, bacterial peritonitis
Laboratory Tests/ Sample Collection	Swab vesicle/eschar (2 dry cotton swabs in sterile container or commercial collection device); punch biopsy if negative Gram stain or if on antibiotics. For consult, page the state lab (DCLS), available 24/7, at 804-418-9923. Consult is necessary <u>before</u> shipment of specimens.	Collect 10 cc of blood in isolator tube or aerobic blood culture bottle. Collect non-induced sputum if respiratory symptoms & CSF if meningeal symptoms.	Collect 10 cc of blood in isolator tube or aerobic blood culture bottle. Collect 5-10 g of stool in unpreserved, sterile container.
Treatment (60 days)	<u>Adults</u> : Ciprofloxacin 500 mg PO q12h <u>or</u> doxycycline 100 mg PO q12h. ¹ <u>Children</u> : Ciprofloxacin 10-15 mg/kg PO q12h (1g/d max) <u>or</u> doxycycline 2.2 mg/kg PO q12 (max 100 mg). ¹ <i>If systemic involvement, extensive edema, or lesions on head/neck, follow inhalational therapy.</i>	<u>Adults</u> : Ciprofloxacin 400 mg IV q12 h <u>or</u> doxycycline 100 mg IV q12h; <u>and</u> 1or 2 additional antimicrobials. ^{1,2} <u>Children</u> : Ciprofloxacin 10-15 mg/kg IV q12h (1g/d max) <u>or</u> doxycycline 2.2 mg/kg IV q12h (100 mg max); <u>and</u> 1or 2 additional antimicrobials. ^{1,2} Switch to oral antimicrobial therapy when clinically appropriate.	
Prophylaxis (60 days)	<u>Adults</u> : Ciprofloxacin 500 mg PO q12h <u>or</u> doxycycline 100 mg PO q12h; <u>or</u> , if strain is susceptible, amoxicillin 500mg PO q8h. <u>Children</u> : Ciprofloxacin 10-15 mg/kg PO q12h (1g/day max) <u>or</u> doxycycline 2.2 mg/kg PO q12h.		
Infection Control	Use standard precautions; patients do not need to be isolated		
Vaccine	Anthrax vaccine is recommended for people that work with imported animal hides or furs, handle animal products in high-risk areas, work with anthrax in a lab, have repeated exposures to anthrax spores, or are military personnel who work in areas where anthrax could be used as a bioterrorism weapon.		
Public Health	Suspected cases of anthrax must be reported to the local public health department by the most rapid means available.		

¹Consider switch to amoxicillin when clinically appropriate. ²Other agents with in vitro activity include rifampin, vancomycin, penicillin, ampicillin, chloramphenicol, imipenem, clindamycin, and clarithromycin. Penicillin and ampicillin should not be used alone. NOTE: According to CDC, amoxicillin is suitable for post-exposure prophylaxis only after 10-14 days of fluoroquinolone or doxycycline treatment and then only if there are contraindications to these two classes of medications. For more information, refer to: Centers for Disease Control and Prevention, www.bt.cdc.gov, and Inglesby TV; O'Toole T; Henderson DA, et al. Anthrax as a Biological Weapon: Updated Recommendations for Management. *JAMA*. 2002;287(17):2236-2252. Available online at: <http://jama.ama-assn.org>